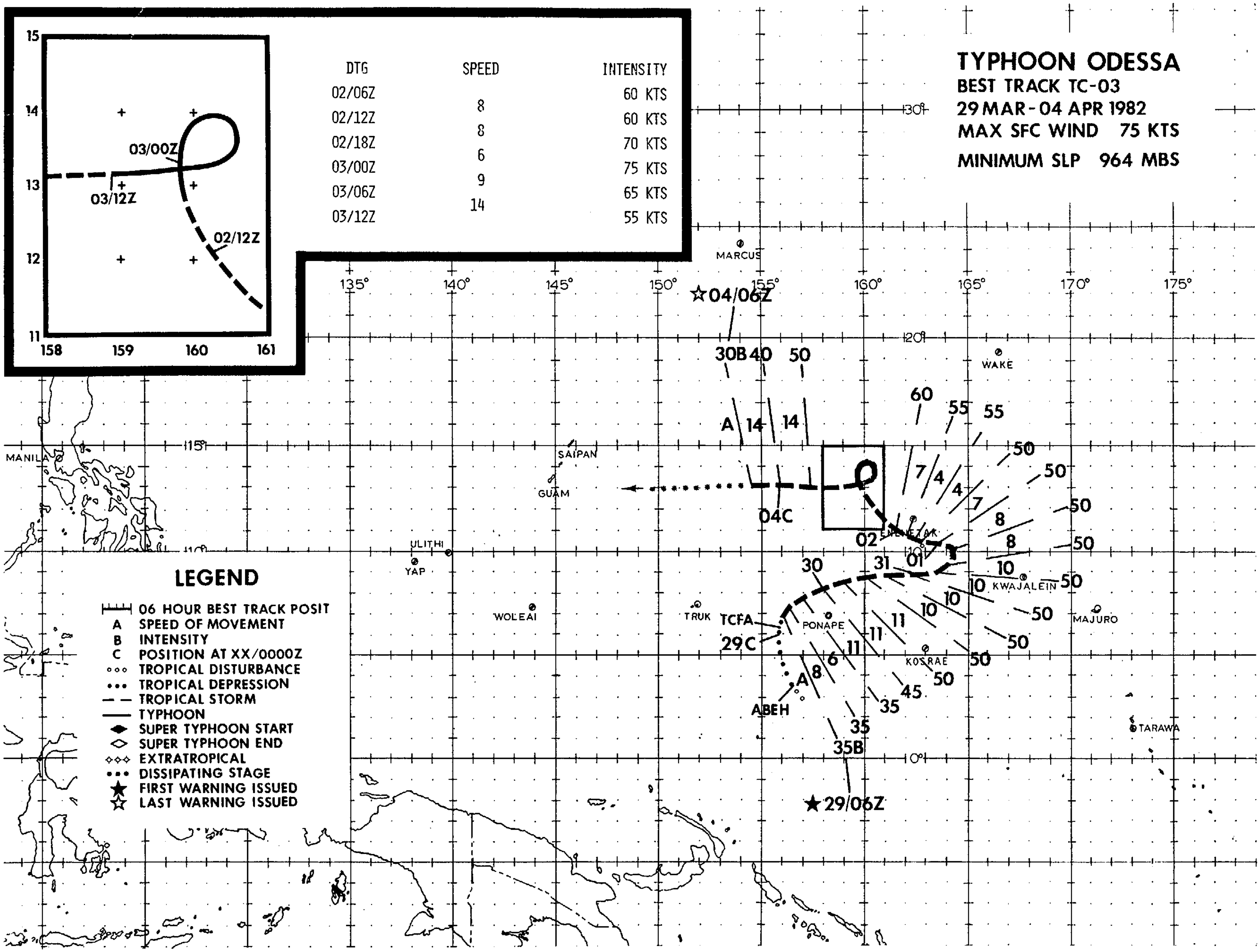
TYPHOON ODESSA
BEST TRACK TC-03
29 MAR - 04 APR 1982
MAX SFC WIND 75 KTS
MINIMUM SLP 964 MBS
DTG SPEED INTENSITY
02/06Z 60 KTS
8
02/12Z 60 KTS
8
02/18Z 70 KTS
6
03/00Z 75 KTS
9
03/06Z 65 KTS
14
03/12Z 55 KTS
03/00Z
03/12Z
02/12Z
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
☆04/06Z
★29/06Z
TCFA
29C
ABEH
35B
30B
04C
MANILA
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
TRUK
PONAPE
KOSRAE
KWAJALEIN
MAJURO
ENIWETAK
WAKE
MARCUS
TARAWA
135° 140° 145° 150° 155° 160° 165° 170° 175°

March is normally a relatively quiet month in the tropical western North Pacific, producing on the average less than one tropical cyclone per year. March 1982 was quite the contrary, with the genesis of three tropical cyclones taking place within a period of 13 days; 1967 was the most recent year with more than one tropical cyclone during March. Typhoon Nelson (02) and the subject of this report, Typhoon Odessa represent only the fifth and sixth typhoons to occur in March since the JTWC was established in 1959.

Just as March was a unique month in the level of tropical cyclone activity, Odessa was unique among the three tropical cyclones. As illustrated in Figure 3-03-1, tropical cyclones which develop near 160E tend to follow one of two climatological tracks: 60 percent move in a generally westward direction and 40 percent move in a generally northward direction. Although both Tropical Storm Mamie (01) and Typhoon Nelson (02) moved westward from this genesis area, Odessa's track defied climatology as it moved both eastward and westward across the area shown for northward-moving tropical cyclones.

Typhoon Odessa was initially detected as an area of loosely organized convection near 2N 159E on 26 March. In the following three days, a cloud system center emerged from these low-latitudes and moved northwestward. A Tropical Cyclone Formation Alert was issued at 290400Z upon receipt of reconnaissance aircraft data which indicated that a closed circulation had developed. As subsequent aircraft data and satellite imagery became available, it was evident that the circulation had rapidly organized and thus, at 290741Z, the initial warning was issued for Odessa with maximum surface winds of 35 kt (18 m/sec)

Much of the remaining discussion will concentrate on the meteorological factors which influenced Odessa's atypical track. To facilitate this discussion, Odessa's best track has been divided into four segments (Figure 3-03-2) representing the different track directions of the tropical cyclone. Each of these segments can be explained quite well in post-analysis when large-scale changes in the mid-latitudes at distances 600 to 1200 nm (1111 km to 2222 km) from Odessa are considered.

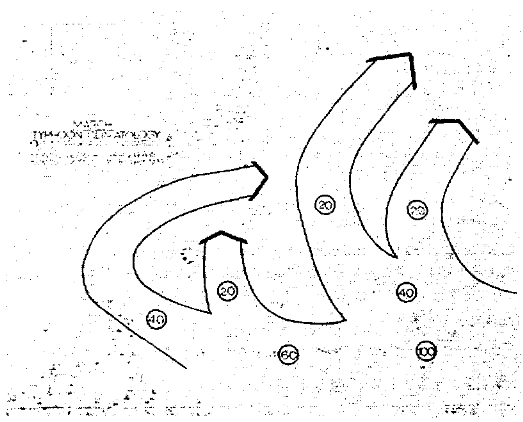

Figure 3-03-1. March Typhoon Climatology Tracks (1WW Special Study 105-8 March 1970)

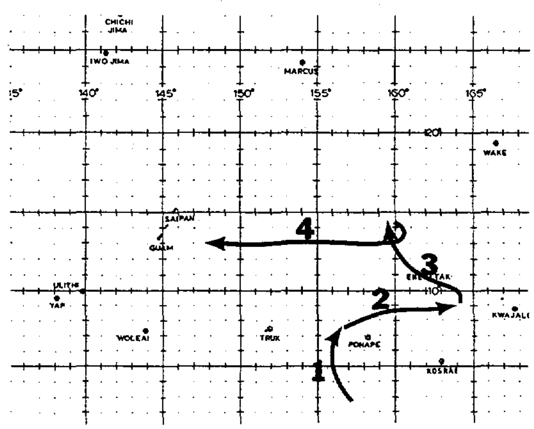

Figure 3-03-2. Typhoon Odessa's best track illustrating the four segments of Odessa's track as discussed in the text.

Odessa's initial movement to the northwest was in response to a weakening of the subtropical ridge northeast of Guam and the rapid cyclogenesis which was occurring southeast of Japan. The first three forecasts described a short-term northwestward movement followed by a more pronounced westward track. However, the continued deterioration of the subtropical ridge, north of Odessa, essentially removed any easterly steering current capable of driving Odessa westward. During the same period, a major high pressure system moved southeastward from Japan and strengthened the low-level northeasterly wind regime west of Odessa. Conventional surface data, at 300000Z, show this ridging extended deep into the tropics and created an effective block to any continued northwestward advance by Odessa (Figure 3-03-3). At mid-tropospheric levels, rawinsonde data from Truk (WMO 91334), Ponape (WMO 91348) and Kwajalein (WMO 91366) indicated that the base of a mid-latitude trough extended well into the tropics and south of Odessa. Although the axis of this trough was located well northeast of Odessa, between 160E and 165E (500 mb), its influence on Odessa's movement became obvious in the days that followed.

On 30 and 31 March, as Odessa tracked eastward at 10 to 11 kt (19 to 20 km/hr), the mid-latitude trough advanced more rapidly eastward and was located near 170E at 310000Z. Odessa, now 400 nm (741 km) west of the trough axis, began to slow and eventually turn toward the north. As Odessa approached 10N, it turned west-northwestward in response to a weak subtropical ridge filling in behind the mid-latitude trough

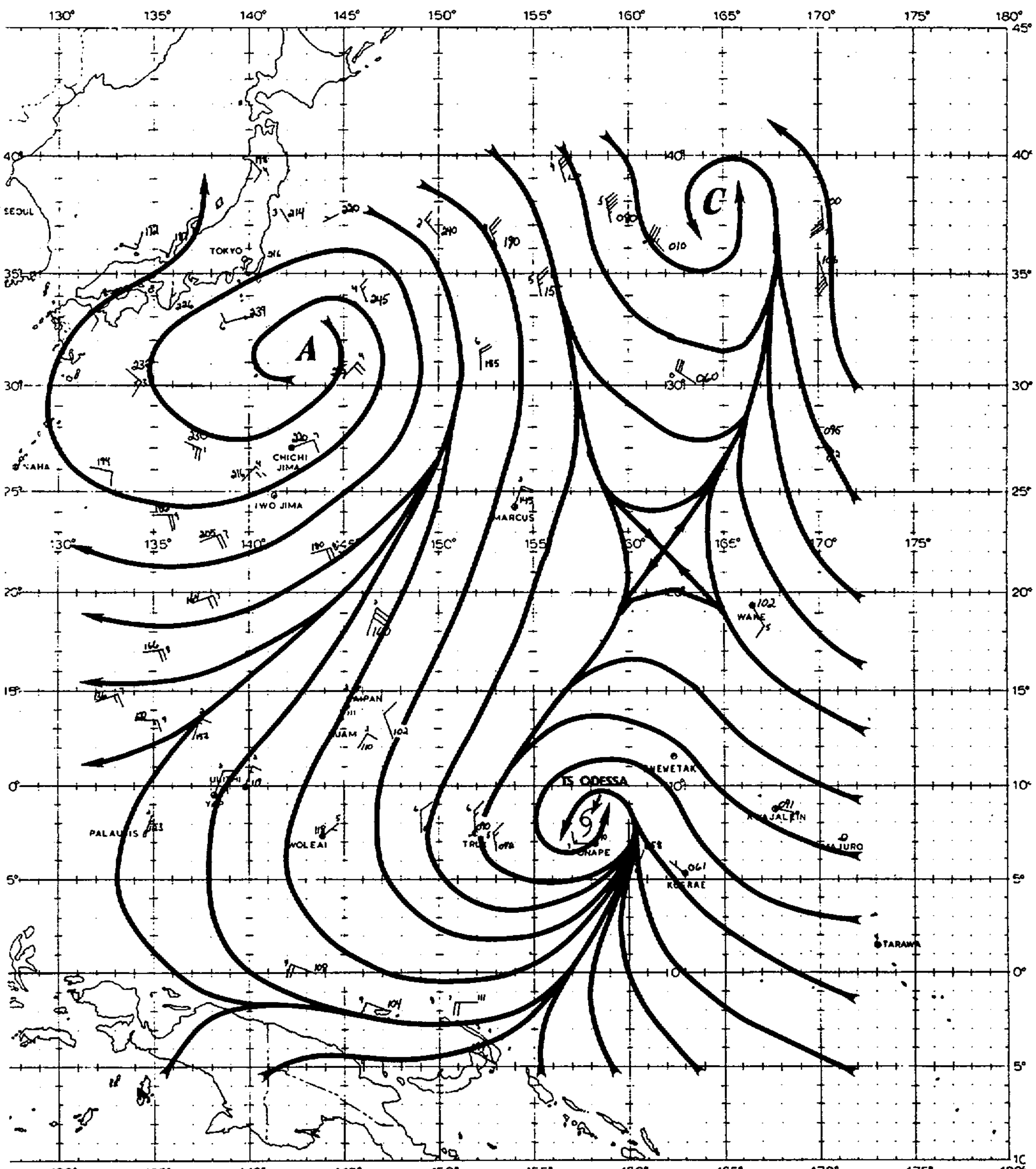

Figure 3-03-3. The 300000Z March 1982 surface/gradient level wind data and streamline analysis. Wind speeds are in knots.

(which had stalled near 175E). To this point, Odessa had maintained an intensity near 50 kt (26 m/sec) as westerlies restricted the development of the cyclone's circulation. With the subtropical ridge in place, Odessa was able to develop a closed circulation in the mid-tropospheric levels and a noticeable intensification trend began which culminated with a peak intensity of 75 kt (39 m/sec) at 030000Z (Figure 3-03-4 shows Odessa just prior to reaching typhoon strength).

Just as Odessa reached maximum intensity, the last major directional change commenced. On 3 April, Odessa was approaching a break in the subtropical ridge, along 158E. Forecasts described a track northward around the ridge axis and then northeastward toward Wake Island. However, strong mid- and upper-level southerly winds moved over Odessa and a rapid shearing of the major convective features to the northeast followed. At 030800Z, a reconnaissance aircraft located Odessa's low-level circulation center 90 nm (167 km) southwest of the closest convective activity. During the 24 hours that followed, Odessa weakened rapidly and was no longer detectable from satellite imagery after 040600Z.

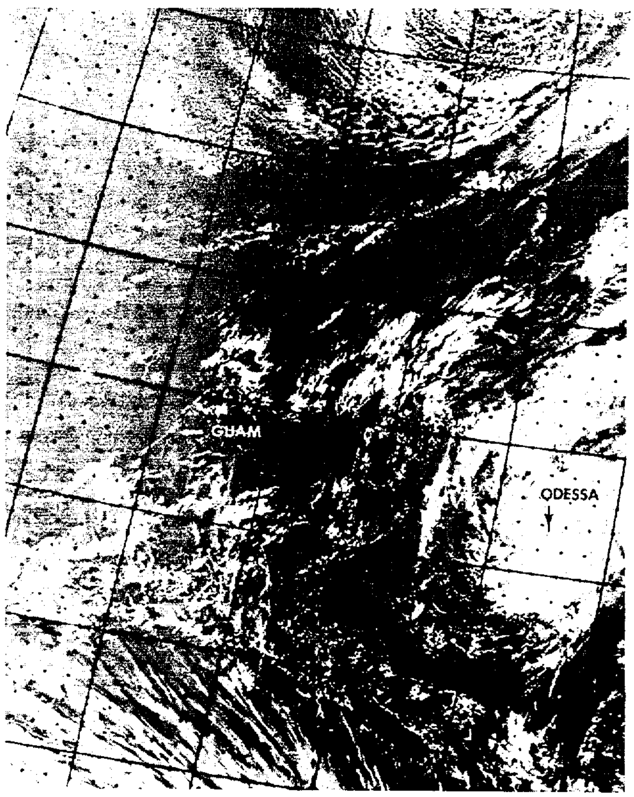

Figure 3-03-4. Tropical Storm Odessa, approximately 18 hours prior to reaching maximum intensity. At this time, Odessa was approximately 90 nm (167 km) west of Enewetak Atoll with maximum winds of 60 kt (31 m/sec). Note the cirrus streamers to the south, these originated from TC 17-82 (Bernie) in the Southern Hemisphere. Later, near 030000Z, Bernie's expansive development would increase the southerly winds moving toward Odessa and aid in the shearing process which led to Odessa's dissipation. 020425Z April (NOAA 7 visual imagery).